

EXTENSION IN AGRONOMY¹K. J. Morrison²

Extension work at Washington State University was started prior to Federal legislation (the Smith-Lever Act of 1914). Extension gained legal status and financial support in Washington State through an Act creating an Extension Program at Washington State College. The Act was passed in 1913 by the State Legislature, creating the Bureau of Farm Development. Farmers' Institutes were held prior to official passage of the Act.

Dr. William J. Spillman, at the turn of the century impressed farmers with the potentiality of high yields of wheat and barley in the State. Farm people visited demonstration trains at a series of stops over the state in 1913. A boys' corn-growing contest was started in connection with the demonstration train during the summers of 1908 and 1909. This project met with success in the longer-growing-season areas of the state.

The need for specialists' help to county agents appeared early. Agents were confronted with many subject matter problems, and the specialists became educators of agents in their respective specialties. The specialist, in turn, was responsible to his department for the subject matter information. The specialist's responsibility included interpretation of research findings and application of the subject matter to the problems of agents and farm people.

Leonard Hegnauer was the first Extension Agronomist, appointed in 1917. He was widely known for his agricultural philosophy and his folksy talks before

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²Extension Agronomist, Department of Agronomy and Soils, WSU, Pullman, WA 99164-6420.

farm groups. One of Hegnauer's greatest contributions was the introduction of Victory oats by means of demonstrations. One such demonstration was established on the Jim Hulbert farm at LaConner, Washington. We now have "Hulbert Hall" named for this friend and servant of WSU.

Hegnauer urged the development of a pure seed, or crop improvement, association in the state and the counties. He, along with the head of the department, Professor E. G. Schafer, joined with farm leaders to organize such a group. But the idea was before its time. It came to fruition in 1946 with the help of E. J. Kreizinger and Alvin G. Law. The newly established organization was named the Washington State Crop Improvement Association, with Eugene L. Harms as first President. Max Hinrichs was one of the members of the Board of Directors.

Mr. Irvin Ingham transferred from Franklin County to become Extension Agronomist in 1942 when Mr. Hegnauer was placed on halftime, semi-retirement status. Mr. Ingham died while still a young man. He was succeeded by Everett J. Kreizinger, who served as Extension Agronomist during 1946 and 1947. Kreizinger then engaged in a commercial business on the west side for several years, but returned some years later to become Extension State Program Supervisor.

J. Lamar Chapman was appointed Extension Agronomist in 1948 and served until May 1950. M. D. "Doc" Butler was appointed Extension Soil Conservationist in 1946. He helped in the development of many of the Soil Conservation Districts in the state. Kenneth J. Morrison was appointed Extension Agronomy Specialist in 1950. Dr. C. B. Harston became Extension Soil Specialist the same year, and in 1951 Henry Wolfe joined the Service, to make up the full complement of Extension Agronomists.

Many farm problems required research by the Experiment Station. These were in the area of crops, soil management, weed control, and soil conservation.

This team of specialists brought much needed information from the researchers to the agents and thence to farmers, fieldmen, and people in agribusiness. The grass silage and improved hay program met a real need for better quality, low-cost feed. New, useful information on pasture management was also brought to bear on the forage program. During one year, 27 silage clinics were conducted. Farmers brought in samples of hay and silage to be graded. Al Shaw and Al Law substituted for the cows in deciding which samples of ensilage "tasted" better! Methods of making and preserving hay and silage were discussed, and emphasis was placed on quality of the hay and silage.

Fertilizer treatments were discussed by Dr. Harston; weed control problems were discussed by Henry Wolfe; and varieties and management were covered by Morrison. Three important developments in the Extension program in the cereals area were the use of certified seed, the fertilization of small grains, and sanitation in storage of wheat. County agent educational meetings were held at Pullman and Lind. There, the specialists in Agronomy and Soils and related fields, along with research workers, kept the county agents abreast of the latest research work and recommendations from Washington State University. These sessions and the field demonstrations helped make the county agents of Washington leaders in expertise on grain production. They carried forward vigorous educational programs.

"C.B." Harston took on a two-year foreign assignment in Pakistan in 1956. Dr. Lowell Nelson came from Puyallup, where he had started the Outlying Testing Program in soil fertility and crop management for the west side, to head up a consolidated research and Extension job for soil testing. This had been a joint responsibility of Reisenauer and Harston. Reisenauer had supervised the Soil Testing Laboratory; Harston had interpreted the results and worked out the recommendations with county agents for grower application of fertilizer.

Ben Roche', who had been county agent in Grant County, was appointed Weed Specialist and moved to Pullman in 1957 to succeed Henry Wolfe, who had become County Agent Supervisor. In 1965, Roche' transferred to the Department of Forestry and Range Management, and Dean Swan came into the state from Tucson, Arizona, as Extension Weed Specialist. Dr. Swan moved the Extension weed program more in the direction of applied research with replicated plots on grains in the major wheat-producing counties of eastern Washington.

Dr. Alfred R. Halvorson became Extension Specialist in Soil Testing in 1957. He succeeded Dr. L. G. Nelson, who had been in that position in 1956 and 1957. He continued to develop and promote the Soil Testing Laboratory and the Program until the Laboratory was closed in 1982. He continued to promote the overall soil testing program until his retirement in 1986.

In 1954 an Outlying Testing Program was started in three central Washington counties--Grant, Adams and Franklin--by Dr. C. B. Harston. "C.B." initiated the program with no equipment or additional help or funds. He borrowed equipment from the Irrigated Agriculture Research and Extension Center at Prosser. His work in outlying testing was in addition to his other Soil Specialist responsibilities, which included the writing of fertilizer recommendations based upon the soil test results of the Laboratory.

The Outlying Testing Program of combined proof-testing and demonstration field experiments was a novel idea implemented by "C.B." Harston, and then expanded and amplified subsequently by those who followed. The need for "proof and demonstration" projects was most acutely felt in the Columbia Basin as it was rapidly changed from desert and very, very dry land farming to irrigation. It was an idea warmly espoused by Dr. J. C. Knott, Director of the Institute of Agricultural Sciences, and by Dr. M. T. Buchanan, Director of the Washington State Agricultural Experiment Station. Superintendent H. P. Singleton, of the

Irrigated Agriculture Research and Extension Center, had been deeply involved with the Bureau of Reclamation in the reclamation of the area of the Columbia Basin to be irrigated from Grand Coulee Dam. Together they had worked out a scheme of early demonstration farms that were called "Pilot Farms", to work on pressing problems before the settlers came into the Project to begin irrigation farming. On these farms many problems were solved, thereby sparing the early farmers a lot of costly mistakes with farming under unknown conditions (Singleton, et al. 1952). Exploratory research on these "Pilot Farms", located on the several typical soil areas, provided an insight to what might be a continuing proof-testing and demonstration of practices and processes that were deemed best for the developing irrigated area.

In Outlying Testing, problems were identified by the county agents. Then the Outlying Testing Specialist conducted a meeting with the Superintendent of the Branch Experiment Station that served the respective area, the Chairman of the Department of Agronomy, the researchers who dealt with these kinds of problems, and the Extension specialists. The problems were listed, discussed, assigned priorities, and action was planned to solve the problems. The Outlying Testing Specialist, serving as a sort of quarterback, worked closely with the agents in selecting experimental-demonstrational sites, arranging cooperation with the farmer of each site and putting out the experiments, tending the plots, holding demonstration meetings with the farmers of the area, collecting the replicated data, and compiling the reports. These reports were studied by the Outlying Testing Committee as a basis for recommendations and for planning the next year's experiments. The results were published annually, as soon after harvest as possible, so farmers could have immediate access to the available information. The system worked! Everyone concerned was happy and enthusiastically performed his part in the action. The scheme worked equally well on the

west side. Other states and other subject matter departments bought the idea and followed the format of this Outlying Testing Program.

The Outlying Testing Program brought the research results to the local level, obtained new information, and reduced the pressure--particularly in the Columbia Basin--for the establishment of local (county) experiment stations. Probably the most important contribution from the Outlying Testing Program was the programmed development of soil test correlations with field results which enabled the county agents to make reliable fertilizer recommendations based on soil tests.

In 1955 Irving Dow succeeded Harold Cosper, who had taken over from C. B. Harston in the Columbia Basin outlying testing in 1954. Part of Dow's Outlying Testing Program was the establishment of "Nutrient Deficiency Gardens" where deficiencies were demonstrated on many crops for various nutrients. Deficiencies of both major and minor plant nutrients were developed and demonstrated for such crops as corn, sorghum, and alfalfa.

Darrell Turner, county agent in Clallam County, succeeded Lowell G. Nelson, who initiated the Outlying Testing Program in western Washington in 1955. Turner worked especially on fertilization and management of pastures. Darrell Turner also met the needs of changing times. When manure disposal regulations impacted dairymen of western Washington, he worked out practical manure disposal standards for the dairymen. He established guides for maximum disposal of manure on the land without detrimental effects. His fertilization program on Christmas trees, huckleberry, and salal were major contributions to the forest industry in western Washington.

In 1964 Dr. Dave Guettinger replaced Dr. C. B. Harston as the general Soils Extension Specialist when the latter took an assignment with the WSU Program in Pakistan. Dr. Guettinger left the Extension Soils position in 1967 to join the

Cominco American Company. He was succeeded by Dr. Carl Fanning, who filled the Soil Specialist position from 1967 to 1969, then left to go with the Tennessee Valley Authority. Dr. Carl Engle came from the University of West Virginia in 1970, to succeed Dr. Fanning. His work in land-use planning, conservation and minimum tillage, contributed valuable information to the Extension educational program. He conducted an effective educational program in the interpretation and use of soil surveys as an aid in developing proper soil use and management programs.

Dr. Harston worked with the Tennessee Valley Authority in its fertilizer demonstration program, an important educational tool in developing fertilizer use for forage production in western Washington. Later, the responsibility was handled by an Extension Specialist hired by TVA but housed with WSU Agronomy and Soils faculty. The successors were Merle Switzer, Robert Mueller, Conrad Kresge, and Roger Wilson.

In the Extension Agronomy program, Dr. Morrison emphasized the use of on-farm demonstrations to introduce new varieties of grain and forage crops. He established grass and legume variety demonstrations in many counties of eastern Washington and grain varieties in all the major grain producing counties. His work helped the county agents to assume the role of leadership in advancing the technology of grain production. Twilight agronomy tours were held at each of the variety experimental plots in the major grain producing counties. These plots were viewed each year by 40 to 120 growers, depending on the location. This program became an important factor in growers' adoption of new varieties and related management techniques as soon as the improved varieties were available. The release of the semidwarf variety, Gaines, was eagerly accepted by farmers, and four years after the release it was planted on nearly all the area adapted to this variety.

The Gaines story is a testimony to the success of research in developing this world record-yielding (209 bu/A)³ wheat, and to the success of Extension in preparing the farmers for acceptance and then the application of the unique management requirements of this variety. The story witnesses Extension's success in working with the Washington State Crop Improvement Association (WSCIA) to increase and distribute equitably this miracle wheat for quickest possible introduction into commercial production (Bertramson 1979).

The seeds from Vogel's hybrid plant selections used to produce breeder's seed were planted in the fall of 1959, using for the first time Dr. Vogel's famous self-propelled nursery planter. These seeds came from Dr. Vogel's breeding program--a USDA and WSU cooperative effort. The packets of seeds from each head of the plants to produce breeder seed of Gaines were hand-fed onto the distributor belts of that planter by Al Law and Billy Gregg. Vogel was the planter-tractor pilot. The next year, any rows of "off-type" plants from a single head were eliminated. Those decisions on "off-type" were made in consultation with Vogel by Al Law and Billy Gregg representing the WSU Foundation Seed Program and the interests of WSCIA in the production of pure seed, true to type.

Harvest of the 1-1/2 acres yielded 75 bushels of breeders seed which were shared with the experiment stations of Oregon and Idaho. Fifty bushels of breeder seed were farmed out to accomplished professional seed growers in Washington through Extension and WSCIA cooperative efforts. Every county agent in the wheat producing counties of eastern Washington had a hand in this process. The two subsequent harvests yielded a 10,000-fold increase of that registered seed (a half million bushels). This is a success story of rapid increase that will likely stand as a record for a long, long time.

³Walley Huppert of Ellensburg, WA obtained this official yield in 1965.

To the Washington State Crop Improvement Association, the county agents, Kenny Morrison, and Al Law goes the credit for helping the seed producing farmers bring off this spectacular increase of quality seed so eagerly sought by farmers everywhere. The registered seed was sold for \$4 per bushel to qualified pure seed growers. It could have been sold for \$25 per bushel on the open market. The philosophy was that all farmers were entitled to equal benefits from this wonder wheat. Hence, all production from Washington's increase was subsequently allocated to the growers of each county as equitably as possible.

Noteworthy is the fact that this new variety produced, in the next decade, a billion dollars of new wealth in the Pacific Northwest beyond what could have been realized from the then existing varieties. Half of this was produced in Washington. The multiplier effect may have raised that figure of wealth to the state by two- or threefold. But, the billion dollars added to the wealth of the Pacific Northwest from this wheat in its first ten years of commercial production exceeded by four to six times all the money invested in WSU's agricultural research and Extension from the beginning of these services in 1891 to 1979--88 years (Bertramson 1979). Many a farmer declared that only Gaines rescued him from bankruptcy.

Dr. Morrison was elected Fellow to the American Society of Agronomy in 1981, and was elected Chairman of the Western Society of Crop Science in 1976. In his program he emphasized county agent educational meetings as the format for extending information. Other specialists in Agronomy and Soils and from related fields were recruited for these training sessions. He kept pace with the times by utilizing radio, TV, and timely bulletins as a source of information for county agents and growers. In 1967, he was assigned to 25% research, and Dr. Stan Brauen at the Western Washington Research and Extension Center in Puyallup

was hired on a 3/4 research and 1/4 Extension position in forage production and management.

Dr. Roy Goss was appointed 1/2 time research and 1/2 time Extension Specialist in turf in 1958. As a Turf Specialist, Dr. Goss gained an international reputation in the turf field. His work with the Pacific Northwest Turf Association and his county agent educational programs contributed much to the turf industry of Washington.

Dwight Peabody, formerly Weed Scientist at the Northwestern Washington Research and Extension Unit, took on a halftime Extension assignment in the mid-70s with responsibility for the Extension weed program for the whole west side. He developed a great following among the farmers and people of industry. He was respected and trusted. His recommendations were gospel.

In 1963, the position of Chairman of the Department of Agronomy and Soils was altered to include a 25% appointment in Extension. Dr. Rod Bertramson was the first Chairman of the Department to serve in this capacity. He was succeeded by Dr. C. D. Moodie in 1968. Following Moodie's tragic death in a traffic accident at Steptoe in March 1970, Dr. Bertramson was Acting Chairman until 1971, when Dr. Jim Engibous assumed the position.

Because the Washington State Crop Improvement Association has been so closely linked with the Department of Agronomy and Soils over the years, some history of it seems in order. The early attempts by the interested and enlightened growers, by Leonard Hagnauer, and Professor E. G. Schafer bore fruit in 1945. Urged by E. J. Kreizinger, Al Law and others, the seed growers organized the Washington State Crop Improvement Association with Eugene L. Harms as its first President. WSCIA was delegated the authority to certify small grains by the Director of the State Department of Agriculture. It purchased foundation seed grown by the Washington Agricultural Experiment Station and

allocated it to farmers, who then grew out registered seed. WSCIA inspected and certified the fields and seed for production of the fourth generation "certified" seed, and then inspected and certified the fields and seeds of that crop of so-called "certified seed". Lamar Chapman helped promote this sophisticated seed program. Al Law served as the Secretary of WSCIA for many years. Henry Wolfe gave him a respite for a few years; but the chores returned again to Al Law until he took on a two-year foreign assignment in 1970 in India. The duties of Secretary have since then been taken on by Dr. K. J. Morrison. He and Al Law continued a keen paternal interest in the affairs of WSCIA. The WSCIA endured trying times along the way. It was a sort of political football, at the mercy of the Director of the State Department of Agriculture. In 1961, WSCIA was at an all-time low. It was in debt to the Washington Agricultural Experiment Station for more than \$20,000 for foundation seed it had purchased to fuel its pure seed program, and for which it had lacked funds to pay. It had established its headquarters office in Yakima some years earlier, with Duward Massie as its manager. It had several field inspectors, and the cash flow failed to cover all these salaries, office expenses, etc. and to pay for the foundation seed.

But Gaines changed all of that! With the release of Gaines and the payment of service charges on the half million bushels of certified seed, the Association became financially independent--in fact, its wealth was at times coveted by the hard-pressed State Department of Agriculture, which wanted to siphon off some of these funds over the years. WSCIA had long since learned the essential survival game of politics, and took care of these threats. As a result of Gaines' release and spectacular increase of seed, WSCIA had in its coffers around \$150,000, and the County Associations, from their cut in the business, were now financially sound. WSCIA was now in business!

Along came an enterprising President of WSCIA, Carl Beckley, who promoted the idea that WSCIA should contract with the Washington Agricultural Experiment Station to assume responsibility for foundation seed production. They set up an office in the WSU Seed House with "Ted" D. Wagner in charge of foundation seed production. They produced the needed foundation seed, worked through their County Crop Improvement Associations, and sold the seed to the seed growers. The program grew; WSCIA prospered! The demand for certified seed increased so much that the Seed House no longer could hold all the foundation seed to be stored. So, in 1978 WSCIA built a huge seed storage warehouse on the Palouse Conservation Field Station. It was appropriately named the "Alvin G. Law Seed Storage Annex Building". It stands as a monument to Law's statesmanship and fatherly guidance that helped WSCIA through those critical early years.

The Pure Seed Program of the State of Washington stands among the best of such programs across the USA. The Washington State Seed Certification tags and green logos on every sack of Washington Certified Seed have credibility second to none. Seeds with these credentials are accepted at face value across the USA and internationally--much like our green paper money. The Department of Agronomy and Soils shares with WSCIA the pride in this prestige.

SUMMARY

Tremendous changes in farming occurred in the period following World War II. Technology in fertilizer use, pesticide use, improved and adapted semidwarf varieties of wheat--to name a few--were inputs that were engines of progress. A key link in taking these advances and technology from the laboratory and experimental fields to applications on the farms was the Extension program, led so ably by those Extension specialists who served WSU. Theirs was pioneering in the modern sense.

Better communications were enhanced by expanded air travel, modern automobiles and super highways, expanded telephone service, radio and TV communication services. All these greatly enhanced the communication between specialists and between specialists and other faculty, as well as with the county agents. These were all essentials in establishing a closeness between researchers, extenders, the fieldmen, the farmers per se, the commodity organizations, and agribusinesses. As in the game of football, in order for everyone on this production team to play his part well, each had to get the "signals". It was the job of Extension to carry the message, to pass the information. The phenomenal success of crop production and application of agronomic practices in Washington is prima facie evidence of Extension's job well done!

REFERENCES

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